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SMALL-SCALE COOPERATIVE INDUSTRIES IN CHINA*

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I am deeply conscious of the privilege of standing on this platform and talking with a group of geography teachers. It is a far cry from the day when as a child I memorized the states and their capitals and the rivers on which they stood. I wonder sometimes if more than I held that childish attitude toward the study of geography and it is with distinct pleasure that I find geography embracing so many of the other humanities. Perhaps you will some day tell us why the Chinese and the Japanese have developed along such different lines. You have already given us a clue.

The summer before the Japanese aggression that finally made the Chinese see that further appeasement was impossible, the summer of 1937, I spent in Japan. I found myself wearying of the stylized two dimensional scenes, of the flat colors with which we are so familiar thru their wood blocks, and of the sky that seemed always to be shutting us in. But I did not realize how weary I was of them until, on the way back to China, the boat sat, as they so often did, on the Tongku bar outside Tientsin. In the clear Chinese sky the zenith seemed to be reaching for eternity. I found my head rising and my spirits lifting. The muddy waters of the China sea around the boat were a symphony of color. Each tiny wavelet was crowned with sparkles of gold. There was purple in the shadows of the cupping wavelets and the brown waters ran the gamut of all the shades of gold and brown. The flat shore stretching on to a horizon that merged into the sky was flaming scarlet and purple and brown. The little plant grew like a great carpet on the brown soil. I was in China again and the weight and compression of the weeks in Japan lifted and I was able to breathe and expand and see a far distance.

* Presented at the New York meeting of the National Council of Geography Teachers, December, 1941.

The capital of old Japan, the beautiful city of Kyoto, lies in a valley surrounded by hills, any one of which could be reached for a picnic. The heart of China was, on the other hand, a great plain. We trundled for days one summer across this great central plain of north China, a line of hills sometimes barely visible on the horizon. Autumn wheat growing up green, kaoliang, its golden brown grain ripening on ten foot stalks, bare earth where the millet had been reaped. Villages—set in their bits of woods and great burial mounds of the departed heroes. We knew that we were riding thru some of the most lived on land in the world, the cradle of six millenniums of unbroken agrarian culture.

China was like a great giant lying with his back to the Pacific and his arms around the great teemy country. His face is toward the west. This is still so. During my last years in China, I went into the interior from several points and always whether I went up a wide placid river, flew by plane, or crossed the hills in a truck, I crossed a psychological mountain range. On the narrow coast strip the people looked east to the foreign lands and across the range they looked west into the heart of China itself.

The cities were market towns and administrative centers, their industries were handicrafts integrated with the farming work, taking its raw materials where they came from the ground and making them into the things the people needed. It was a rich country that Marco Polo found.

INDUSTRY COMES TO CHINA

Then came the traders of the western countries and forced their way in. It did not amount to much before 1900, scarcely more to the nation as a whole than the birds who feed on the backs of the rhinoceros and hippopotami are to them.

Then the tentacles of trade began to reach out into the country. Standard Oil tins began to be seen in the country villages instead of the wooden water buckets. Cotton prints from Manchester and later from Osaka began to take the place of the peasant weaves. Cigarettes with the trade marks of British and American tobacco companies began to take the place of the old tobacco pipes, matches from Sweden and then from Japan took the place of the flint and steel. Soap began to take the place of lye and soda.

The old empire resisted the modern ways and kept them to the coastal strip. The first years of the republic from 1911 to 1927

were turbulent and during the years of peace from 1927 to 1937, a new industry grew up to make in China some of the things it had imported from England and Japan. There was English capital and Japanese capital and some Chinese capital.

Because China came so late into the industrial game, it was cheaper and easier to get processed raw material from abroad than to process its own raw materials. It was even cheaper to send its raw materials abroad to be processed and then back to China to be made up into goods. I spent many years of my life in Chefoo, the hair net city. They took the hair of Chinese women, sent it to England and America to be split, dyed and disinfected, sent it back to China to be made into hair nets, and then back to England and America to be sold. This story is typical of the way of other raw materials.

Fig. 1. A water wheel in southwest China built to supply power for an industrial cooperative ironworks.

Despite all modern inventions, water-power continues to remain the cheapest power possible, if a scientifically constructed wheel is used. C.I.C. engineers have made wide use of this type of energy, and water wheels now provide power for flour mills, oil-pressing plants, wool-spinning units, machine shops, foundries and similar industries.

Shanghai had cotton mills but the yarn came from India. Shanghai had newspapers and publishing houses but the paper came from America. Machinery came from England and America and Japan.

Gradually these goods crept back into the country along the waterways and the new railroads and the old handicrafts began to die away. Some of the young men and women from the farms began to stifle in the slums around the factories that grew up around Shanghai and Hankow and Canton.

DESTRUCTION OF MODERN INDUSTRY

When the Japanese took Shanghai and the towns around, they took 70 per cent of China's modern industry. When they took Hankow and Canton they brought the toll up to 90 per cent. This was a young industry and a small industry. All of it could be placed in the approaches to any modern American industrial city. But it was vitally important to China.

Its destruction meant that for many essentials, such as cloth and soap, to mention two, China would have to buy from the Japanese (the blockade made import from other countries almost impossible) and thus help the enemy win their own war, go without these goods, which would mean a loss of efficiency and morale or make them themselves in a country where a factory chimney means a bomb.

REFUGEES

There was another pressing problem, that of the 50,000,000 refugees pushed back across the country. Would they devastate the land as in an overflow of the Yellow River, or would they be like the sediment left after the overflow of the Nile and enrich the land? Among them were a few farmers, many small townspeople and people from the cities, small shopkeepers, students and also there were the skilled workmen from the coastal factories. The Chinese government and the Chinese people have been meeting these problems in many ways. The government has built up factories in Szechuan. You have all heard of the trek of machinery up the Yangtze River.

A NEW ZEALANDER HAS A SOLUTION

The way to meet these problems that I want to tell you about is that worked out in 1938 and operating in eighteen of the provinces of China, the Chinese Industrial Cooperatives.

In Shanghai there was a group of people who met often to talk over the problems of the country. Among them were American newspaper writers, Chinese engineers trained in America, a Chinese cooperator trained in Scotland and Denmark, some Chinese bankers and Rewi Alley.

Rewi Alley, a New Zealander, left college at the age of seventeen to fight in the first World War and came out four years later with a military medal and a pair of crutches. To get back his health, spiritual and physical, he spent six years on a sheep

farm. He got his legs back to such good account that he now walks (when he can't get a plane or a truck) all over China inspecting the cooperative industries, stimulating the workers and the leaders, and acting as spark plug to this new industrial movement.

Among those who planned the Chinese Industrial Cooperatives was the British Ambassador, Sir Archibald Clark-Kerr. He told Madame Chiang Kai-shek about it and she saw that the plan was

Fig. 2. Silk weaving co-op in the Northwest. Boy at the left is winding the silk from skein to drum; those at right are preparing the ware for the looms, while two weavers have come out from the factory behind.

good. She took it to her brother-in-law, Dr. H. H. Kung, the Minister of Finance and he saw that it was good and appropriated some funds and the work was started in September, 1938.

Dr. H. H. Kung asked Rewi Alley to gather a staff and set to work. He sent for these engineers and cooperators he knew in Shanghai and sent them out two and two, an engineer and a co-operator to each of the five places chosen for headquarters. I once asked Rewi Alley how he chose those spots on the map. "By the formation of the land and the communications." He chose places where the refugees were likely to gather and places where some measure of protection from the enemy was given by the ranges of hills and where rivers offered some chance of escape. In the north west Paoki, at the end of the east and west railroad, was the head-

quarters. Descriptions of this town remind me of the cities of the middle west in the 1830's and 40's. Chungking, where the government was located; Kumming, the Chinese end of the Burma Road; Kweiyang, where the hills look like giant bones strewn on the plain, hills with caves that make perfect air raid shelters; and Kanchow in Kiangsi where a great placid river flows away from the part of the province taken by the Japanese, were the original headquarters.

Two Thousand Workshops for China

These small units, seven people, ten people, fifteen, thirty workers in a group now number about two thousand industrial cooperative units. They represent 200 trades and make over five hundred kinds of goods. These are largely consumer goods, which we take for granted but which make all the difference between morale and lowered morale. But there is also the great need of cloth. They spin and weave silk, wool, cotton and linen. And there is direct contribution to the war effort as well as the indirect. The cooperatives make uniforms and blankets for the soldiers and some small arms as well. There are fifty thousand workers in these industrial cooperatives, but it is estimated that a million people derive most, if not all, of their subsistence from the existence of the Chinese Industrial Cooperatives.

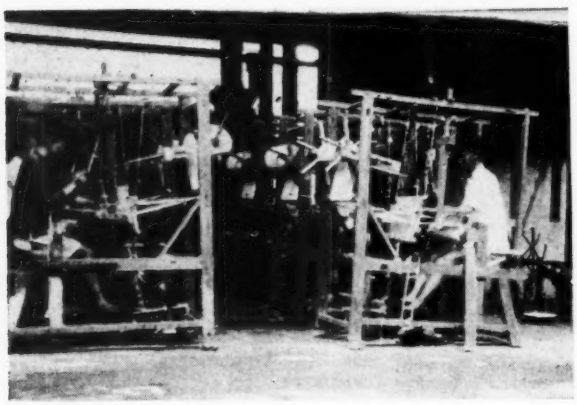


Fig. 3. A spinning co-op in Southeast

$7, $12, $15 will start one man to work. Then he no longer needs help, but supports himself and his family. Anything from $50 to $5000 will start a new workshop depending on the number of people involved and the amount of machinery. The money placed out turns over three times a year so a man may support himself and adds twice the amount to the goods of the country. With a total capitalization of about $500,000, there is a monthly production value of a million dollars.

There is not enough known of the raw materials of China to be able to tell you what can be the future. In many places the peasant half starves over great wealth within the ground. To utilize the wealth on top of the ground and what they know of what is within, takes technical and scientific knowledge, and that with which the raw materials can be processed. To build this up, the Chinese Industrial Cooperatives have research laboratories, and technical schools. Their American trained engineers send to our New York office and ask for the answers to some of their knotty problems.

Fig. 4. A Chinese industrial cooperative's camel transport convoy in northwest China carries goods from producers to consumers.

Some of the problems are being solved. Because most of the cotton growing part of the country is in the hands of the Japanese, ramie (native linen fibre) must in many ways take its place. But ramie is stiff. There are many ways of making it soft and there must be more ways discovered. The Chinese iron is full of sulphur. To make it suitable for use in the making of machinery, there are many technical processes being developed. Substitutes must often be used. Castor plants grow in hedges all over China and the oil makes good soap as well as medicine. Without the supply of foreign and coastal paper, new grasses must be found, treated and made into paper. With the aniline dyes of Europe cut off, the old indigo acorn and earth dyes must be revived. There is a boom in the silk processing which has been done in the territory now under the Japanese.

The question of prime movers is a great problem. In many places it is still man power. There is development in the use of water power and the very small beginnings of the use of electricity. But in many places it is the alcohol or the charcoal burning engine that must at this stage of development do the work.

The weekly meeting of the Chinese Industrial Cooperatives becomes the social event of the countryside. They meet together and talk over their problems; they sing hymns and patriotic songs. They find that some cannot read so literacy classes are started. They start schools for the children. Out of the profits they have health clinics, public health nurses and small hospitals.

LEARNING TO MAKE DEMOCRACY WORK

The accomplishments of the Chinese Industrial Cooperatives are both in the field of the concrete and of the intangibles. It is giving livelihood to a million refugees and dispossessed. It is giving Chinese made goods to the Chinese people and army. It is developing the Chinese raw materials. It is giving a social life to the people who have been routed out of their homes and countryside. It is making goods that are helping to win the war. And it is building for democracy.

Dr. Sun Yat-sen, the founder of the Chinese Republic, taught the People's Three Principles which can be summarized by Abraham Lincoln's For the People, Of the People and By the People. Madame Sun Yat-sen says that the Chinese Industrial Cooperatives are helping to fulfill the principles of "For the People" by giving the people a livelihood. All who work in the tiny workshops know that they are "Working Together" with the thousands in the other tiny workshops in a great movement to win the war for their country.

The processes of democratic rule were unknown to the Chinese. Dr. Sun said that they needed a period of tutelage. But no one can learn to do that which they have never seen. The Chinese Industrial Cooperatives are giving them this chance of tutelage. Every time the workmen gather around their conference table and talk over the problems of the business they own and run, they are learning how to make a democracy work.

These workshops are small now. After the war they cannot stay as small. But it is hoped that they will utilize the possibility of decentralization made possible by electricity and that all over the country, small factories, using local raw materials may give the people the goods they need and that even the heavy industry may be more decentralized than has been the case in any other country. So that all the parts may be developed and the piling up of huge slum concentrations and their attendant slums can be avoided.

THE SUNDIAL: AN INSTRUMENT FOR EDUCATION

R. NEWTON MAYALL
In Charge of Ernst Collection, Harvard College Observatory

In the March, 1941 issue of the JOURNAL OF GEOGRAPHY, Dr. Raisz clearly explained the use of the analemma as it appears on terrestrial globes. Just as he showed how it could be used to calculate the height of trees and other objects together with similar practical uses, so can the analemma be injected into the sundial to provide Standard Time by direct observation of the sun. It is this use of the analemma that I want to enlarge upon, and draw attention to the use of the sundial as an educational instrument.

Our present day knowledge of the sundial as a time-keeper dates back to 1500 B.C. The following 3000 years saw many changes made in its form and accuracy. That brings us to 1500 A.D., a period in which the sundial was beautifully wrought and the principles of its construction were well laid down. In fact, the principle of construction has not changed in nearly 2000 years!

From 1500 to 1800, the sundial was at its height and it was an efficient timekeeper. This period also marks the introduction of mechanical timekeepers, yet sundials held sway as the favored "clock." They were also made in portable form, small enough to be carried in the vest pocket; and they were also placed in the back cover of watch cases, so unreliable were the watches of that day. The portable sundial was big business in those days, and they were as common as watches are today.

PRINCIPALS OF TIMEKEEPING

The principle of timekeeping for the watch and the sundial is the same. Each instrument is based on the assumption that the sun always travels at a regular rate along the celestial equator, thus marking off equal intervals of time. But we know the sun does not do that, therefore any instrument, such as the sundial, that makes direct use of the sun must in its basic outline record sun time. Technically speaking "sun time" is referred to as Apparent Time (true solar time). Watches show Mean Time, wherein all hours are of the same length and we use twenty-four of them to note the day. It is obvious then that there would be a difference between an Apparent Time sundial and a Mean Time watch. The amount of this difference can be calculated and tabulated, and it is called the Equation of Time. By means of the Equation of Time you can

obtain Apparent Time from your watch, or Mean Time from your sundial.

The Equation of Time in its most common form appears in almanacs as "sun slow" or "sun fast," which merely means, in the former case, that the sun is on the meridian after the clock has indicated the noon hour (Mean Time); and in the latter case the sun will reach the meridian before the clock records the noon hour.

Equation of Time

The Equation of Time is called positive or plus (+) when the sun is slow and negative or minus (—) when the sun is fast. In other words, if you have a sundial and want to obtain Local Mean Time from it, all you have to do is add or subtract the value of the Equation of Time for any day to or from the reading of the sundial, as the sign is + or —.

Origin of Standard Time

Standard Time is of recent origin, having been put into effect first in the United States, in 1883. It is a convenient method of keeping time over large areas. By means of this system all watches and clocks within a certain zone will show the same time and those clocks in adjacent zones will vary by exactly one hour. Everyone today is more or less familiar with this system and the geographical boundaries of the zones. It was conceived by Dr. Charles Ferdinand Dowd, of Syracuse, New York, where a tablet in the Presbyterian Church commemorates his great invention.

Factors in Timekeeping

Because the time of everyday life is based upon the sun and not the stars, there are three important factors in timekeeping—the position of the sun, Equation of Time, and longitude. These factors can be demonstrated by the sundial, and their differences can also be observed in one sundial. For these reasons the sundial is an excellent instrument to use in the classroom—not just as an instrument to be bought, displayed, and explained; but let the pupils make a sundial.

The Sundial in the Classroom

Making sundials is already a part of the curriculum of many schools—particularly private schools. Children of seven and eight

years can easily understand the simple principles, and make sundials. Every year several classes of children of that age visit the Harvard Observatory where they can see one of the largest collections of portable sundials in the world. They make notes, and these less than teen age youngsters show by their questions that they know more about time and sundials and their relation to geography than many high school teachers and certainly more than 90 per cent of the public. They learn by doing.

The present procedure in many schools is to make the children (beginning with the fourth grade) acquainted with time in general, and with the ancient instruments such as sand glasses, time candles, knotted cords, water clocks, and sundials. At the same time, they make a time candle and perhaps a sinking bowl. In this way they can observe time as a definite measure which they can adapt to their own needs, such as a time candle marked off in sections which will be consumed during a classroom period. At this stage, if a sundial is made, it is usually of the simplest sort and the teacher helps in the construction; but in the following years the sundial is introduced continuously right up to high school. Studying the time zone charts of the world is also a part of the work.

The pupils find that making sundials can be both entertaining and practical. Some practical knowledge of astronomy and geography can be obtained, and those in the higher classes and in the secondary schools find making sundials a practical use for their trigonometry and geometry. Therefore the sundial need not be confined to geography classes, for it can also be used to good advantage in general science courses, mathematics classes, and in the trade schools or vocational classes. Sundials can be made of almost any material—thus they can be used in cardboard model classes, woodworking and metalworking classes.

How to Make a Sundial for the Classroom

For the benefit of the teacher who would like to make use of the sundial for instructional purposes, the accompanying drawings show a simple instrument that lends itself to construction by primary and secondary school children, as well as for demonstration purposes in general science and geography classes.

Figure 1 shows the appearance of the assembled dial when looking straight down on the face. No attempt to give dimensions has been made, but the diagrams have been drawn carefully to

scale. The size and design is left up to the teacher or the children. The basic elements are given and they can be applied in whatever manner the teacher desires. The dial plate is very easily laid out. All hours are equally spaced at 15° of arc. Every 10 minutes has been indicated, but these divisions can be varied to every 5 minutes

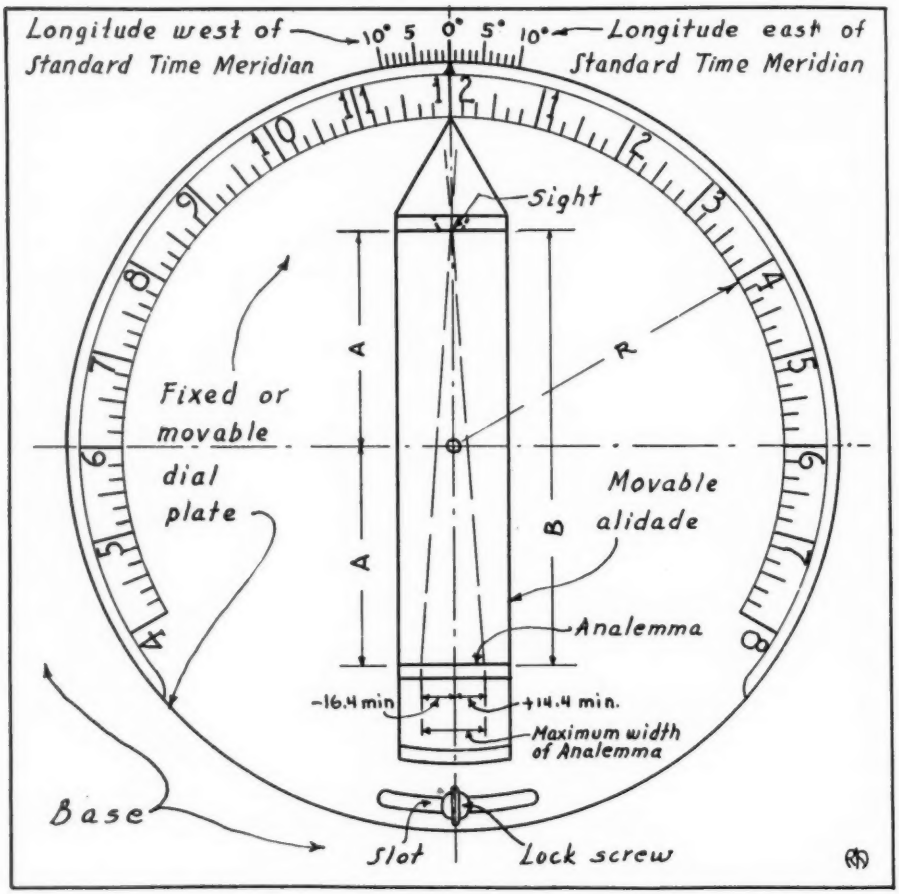


FIG. 1. Looking down on face of dial.

or every minute, depending upon the size of the hour band—that is, the radius R. The distances A-A are equal—each is one-half B. The axes of the dial plate are indicated by dot and dash lines.

Figure 2 shows the appearance of the dial from the side together with the theory of the construction of the alidade.

Figure 3 shows how to make a standard analemma with the aid of a protractor. After laying out the grid, as here laid out, for

each degree of declination (distance of sun above or below the celestial equator) and the Equation of Time (Mean Time minus Apparent Time) for every four minutes, plot the declination and Equation for the 1st, 10th, and 20th of each month; or more frequently, depending upon the size of the dial and analemma. The tabulated values used for this diagram are given below.

The sight is indicated in Figure 4. Here are shown two methods—crosshairs and pointer—which cast a shadow. Instead of

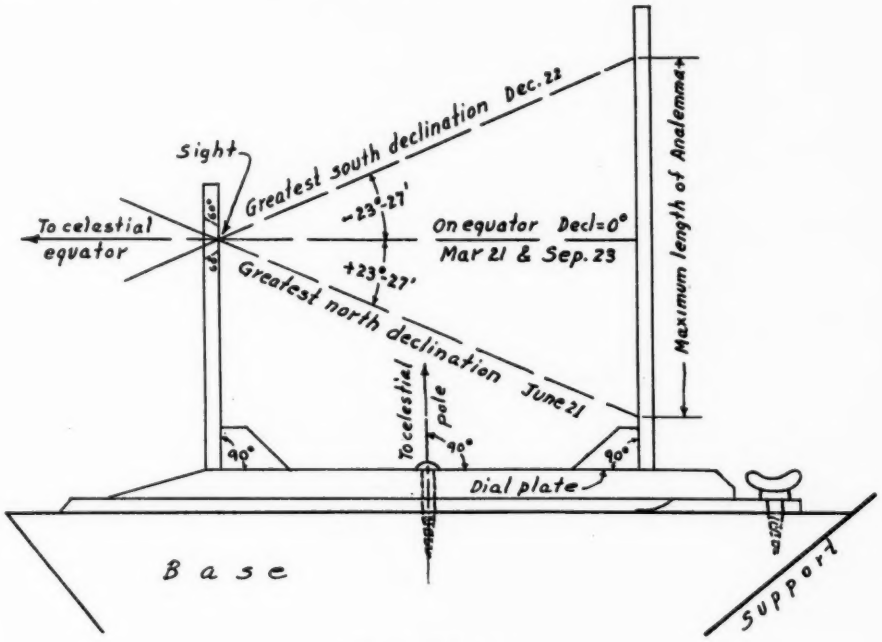


FIG. 2. Side view.

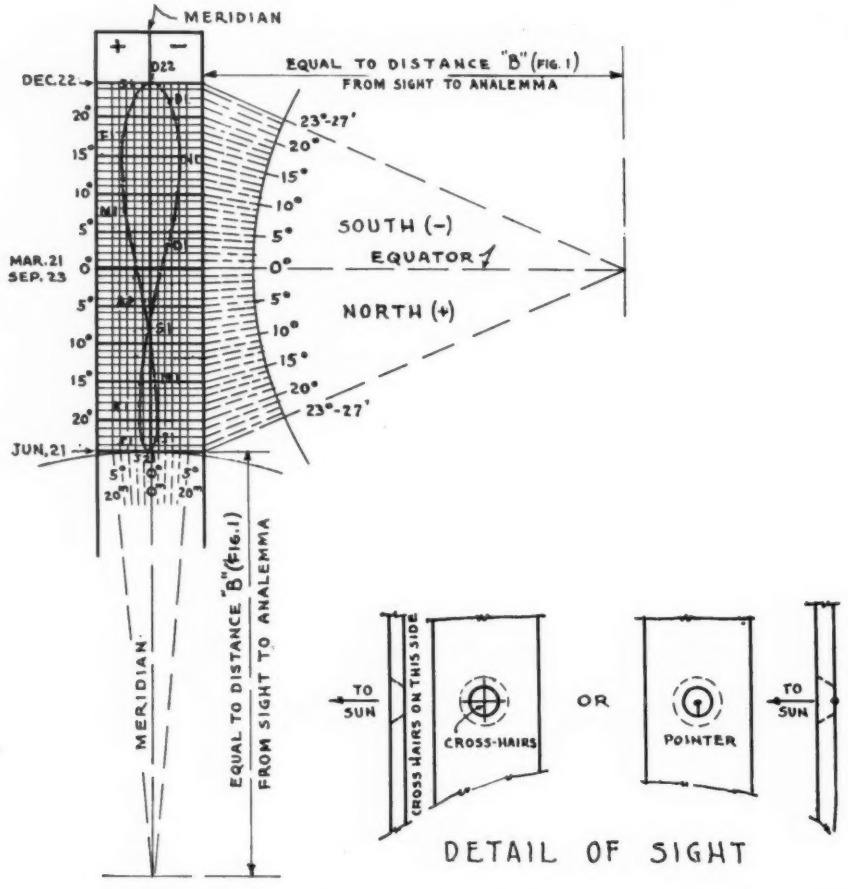
these a very small hole can be used, in which case a very small spot of light will fall on the analemma, instead of a shadow. Be sure to bevel the hole as indicated, at least 30° on each side of the equator so that the rays of the sun can pass thru the hole on June 21 and December 22 when the sun is respectively highest and lowest in the sky.

Figure 5 shows the complete dial, on its base and support, ready for use. A line thru the center of the dial and perpendicular to the dial plate should point directly to the celestial pole (not the North Star), as indicated both here and in Figure 2.

The points necessary for plotting the curve of the analemma

can be derived mathematically, if so desired. The method of doing this is shown in Figure 6.

I think the drawings are sufficiently self-explanatory so that little more need be said about how to make the various parts and



Figs. 3 and 4. How to make a standard analemma (Left). Detail of sight (Lower right).

put them together. Therefore let's see how it works and what you can do with it.

Orientation and Use of the Dial

The dial plate (when ready for use) should lie parallel to the plane of the equator, and the alidade rotates about the center of the dial. The equator and meridian lines should be drawn on the analemma (see Figs. 3 and 6). As many days as desired can be

marked around the curve of the analemma—similarly as many degrees of declination as desired can be marked both in days and degrees. These lines make it possible to obtain either Apparent Time, Local Mean Time, Standard Time, the sun's altitude, the day of the year, and so forth.

To Set the Dial. Turn the dial plate so the arrow above the 12 mark will be opposite the number of degrees of longitude your

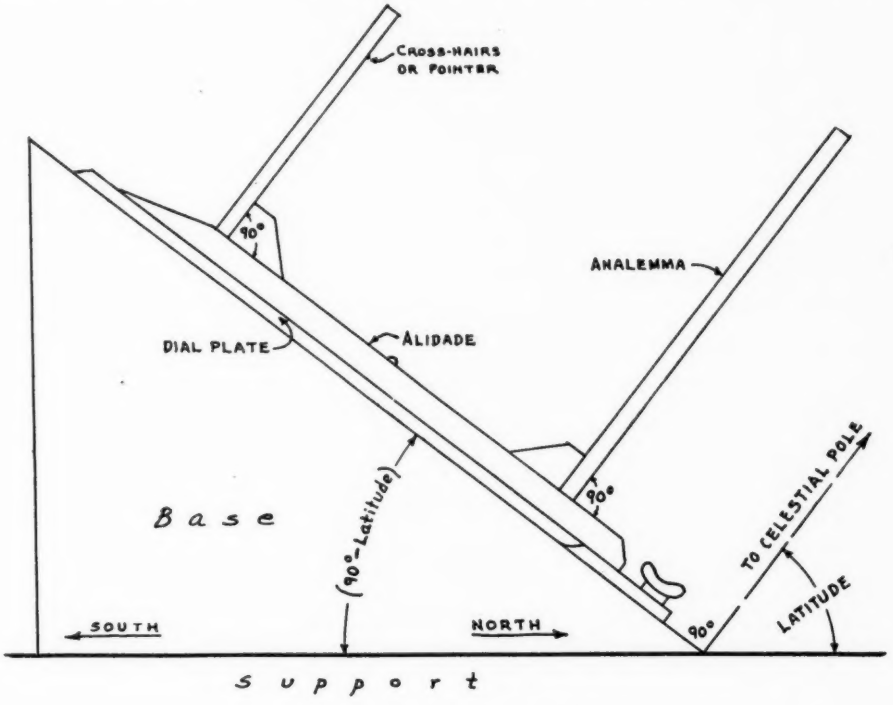


FIG. 5. The assembled dial.

place is either east or west of your Standard Time Meridian, in accordance with instructions in the corners (Fig. 1). Then place the dial on a level support and set the pointer of the alidade to 10 o'clock, noon, or any hour you prefer. About five minutes before the selected hour, turn the whole instrument (without disturbing position of alidade) so the shadow of the pointer in the sight or a spot of light hits that part of the analemma corresponding to the time of year. At the exact instance of the hour selected, fix the dial in place; then it will be properly set to tell time as long as you want it to. Just to make sure everything is all right, check the

setting a few hours later. When you are satisfied with the setting you can fix the dial in place permanently; and then it is ready for use. (For classroom use, the dial can be set in the window when needed. After its proper orientation has been determined once, mark the location so the dial can be reset quickly at any time, without trouble.)

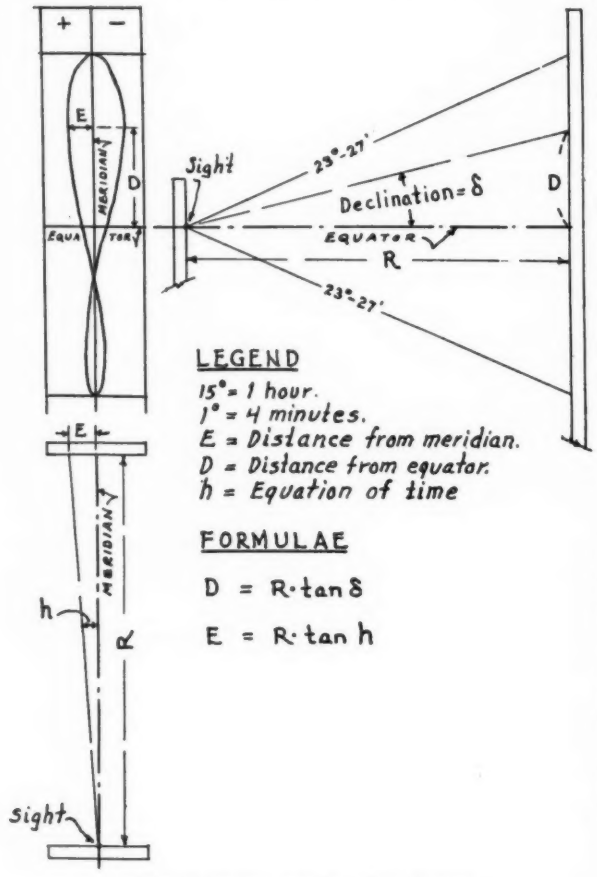


FIG. 6. Computation of analemma.

To Obtain Apparent Time. Set the 12 mark as shown in Figure 1—opposite 0° on the longitude scale. Then turn alidade until shadow of pointer in sight is centered on the meridian line of the analemma.

To Obtain Local Mean Time. Set the 12 mark as shown in Figure 1—opposite 0° on the longitude scale. Then turn alidade until shadow of pointer in sight is centered on that part of the curve of the analemma that corresponds to the day of the year.

To Obtain Standard Time. Set the 12 mark on the dial opposite the number of degrees on the longitude scale equal to the number of degrees the longitude of your place is east or west of your Standard Time Meridian. Then turn the alidade until the shadow of the pointer in the sight (or spot of light) is centered on that part of the curve of the analemma corresponding to the time of year.

Once the dial is set up, as above, with its axis (12 o'clock line)

lying in the plane of the meridian, the day of the year can be read directly from the analemma without setting the dial plate—just note the position of the shadow of the pointer in the sight as it hits the analemma. Similarly the declination of the sun can be read off (if the grid is retained as shown in Fig. 3). Then the altitude of the sun at noon can be obtained by adding the declination to the complement of the latitude when the sun is north of the equator, and subtract the declination when the sun is south of the equator.

It is obvious that if the names of various well known places within the tropics are noted opposite the lines of declination on the grid corresponding to their latitudes, it is possible to tell when the sun is overhead at noon in those places—or as Dr. Raisz previously pointed out (JOURNAL OF GEOGRAPHY, March, 1941, p. 90) the analemma on the globe is a "line which connects the points on the earth's surface where the sun is directly overhead on each day of the year," when the Local Mean Time for the meridian of the analemma is 12 noon. Therefore the analemma on the sundial can be used in the same manner, because the declination of the sun is also the latitude where the sun is directly overhead. Other uses for this dial will doubtless present themselves to various teachers.

MAKING THE DIAL FOR YOUR GARDEN

Perhaps you may want to make such a dial for your garden. If so, it can be built in the same way, but a fixed dial plate may be found more satisfactory. This can be accomplished in two ways: first, you can lay out the hour lines as shown in Figure 1, but have the 12 o'clock line offset by an amount equal to the difference in longitude between your place and your Standard Time Meridian, and in the direction indicated in the diagram. Then a simple twist of the alidade to center the shadow of the pointer in the sight on the standard analemma, will always indicate the Standard Time.

The second method is to incorporate the difference in longitude between the Standard Time Meridian and that of your place in the analemma itself. In this case the 12 o'clock line will not be offset, but will occupy the position shown in Figure 1. The analemma, however, will be shifted either east or west, depending on your relation to the Standard Time Meridian. If you are east, subtract from the Equation of Time 4 minutes for each degree of difference in longitude; if west, add to the Equation of Time 4 minutes for each degree. Then plot the new values in the same manner

as for the standard analemma in Figure 3.

The days, declination of the sun, and Equation of Time used in plotting the standard analemma in Figure 3 are as follows:

TABLE SHOWING VALUES FOR SUN'S DECLINATION (δ) AND EQUATION OF TIME (h)
Compiled from American Ephemeris

Date	δ	h	Date	δ	h
Jan 1	−23°02′	+ 3.6min	Jul 1	+23°08′	+ 3.6min
10	−21 59	+ 7.6	10	+22 16	+ 5.1
20	−20 10	+11.1	20	+20 43	+ 6.2
			26	+19 30	+ 6.4
Feb 1	−17 09	+13.7			
10	−14 24	+14.4	Aug 1	+18 05	+ 6.2
12	−13 45	+14.4	10	+15 38	+ 5.3
20	−10 59	+13.9	20	+12 32	+ 3.4
Mar 1	− 7 39	+12.5	Sep 1	+ 8 22	+ 0.0
10	− 4 11	+10.5	10	+ 5 01	− 2.9
*21	+ 0 10	+ 7.4	*23	+ 0 01	− 7.5
Apr 1	+ 4 28	+ 4.0	Oct 1	− 3 06	−10.2
10	+ 7 52	+ 1.4	10	− 6 34	−12.9
15	+ 9 42	+ 0.1	20	−10 16	−15.1
20	+11 27	− 1.0			
			Nov 1	−14 22	−16.3
May 1	+15 01	− 2.9	3	−15 00	−16.4
10	+17 34	− 3.7	10	−17 06	−16.0
14	+18 35	− 3.8	20	−19 39	−14.4
20	+19 56	− 3.6			
			Dec 1	−21 47	−11.0
June 1	+22 02	− 2.4	10	−22 54	− 7.2
10	+23 00	− 0.8	*22	−23 27	− 1.5
14	+23 16	− 0.0	25	−23 25	+ 0.0
*21	+23 27	+ 1.5			

Note: Underlined dates and values indicate critical points on the curve of the analemma.

The dates of the equinoxes and solstices are preceded by an asterisk (*).

A HIGH SCHOOL CLASS SURVEYS ITS TOWN

MARGARET STOWELL
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Toward the end of the school year 1940-1941, students in the economic geography class of Plymouth High School, Plymouth, Wisconsin, made a land-use map of their city. The class was a mixture of twenty-eight sophomore, junior and senior students. The project was carried out as an urban study and was, therefore, limited to the city itself. The project took two weeks.

Plymouth is a Dairy-Belt city located in the East-Central Wisconsin "kettles" region about sixty-five miles northwest of Milwaukee. It has a population of approximately 5,000, mostly German. It is primarily a "cheese" community, competing with other Wisconsin cities for the title of "The Cheese Center of the World." Its position in a cheese-producing section of the Wisconsin dairy belt is reflected in the many industries engaged in the manufacture of cheese and allied products.

Permission and cooperation for the project were given freely both by the superintendent of schools and by the principal of the high school. Both helped in securing the necessary materials and in making arrangements for student work schedules. Miss Olive Thomas, a member of the geography department of the Whitewater State Teachers College, Whitewater, Wisconsin, was very helpful. To her, the teacher was indebted for suggestions of procedure and for the use of valuable printed materials.

A city map, published by a local engineering company, was used as a base map. The teacher divided the map into five large sections and made enough ditto copies of each section so that the students had ample base map material. A "master" map was later made, upon which the use of land in Plymouth was shown in color. Figure 1 shows a copy of the completed master map, with color symbols translated into black and white.

For working efficiency, the class was divided by the teacher into five committees—one for each large section of the city. Each committee then apportioned its section among its members, with each member responsible for a definite part. Some students chose to do the whole section, others only parts. Some areas of work overlapped.

After preliminary administrative arrangements, the project proceeded as follows:

Step I. Working out of a time schedule with the students
Step II. Preparation of the code and selection of areas of work
Step III. The field work
Step IV. Translating field notes into color on individual maps
Step V. Making the master map

Step I. Working Out of a Time Schedule with the Students

Each student worked out an individual time schedule with the teacher. Arrangements were made with the office, with the homeroom teachers, and with study hall teachers for absence during school hours outside of the regular class period. The class period of fifty minutes was used during the two weeks of the project. After-school hours and weekend time were also used for field work. Using the class period and available study hall and homeroom periods, the average student was able to spend approximately two hours a day working on the project.

Most students were out each day during the regular class period, altho it seldom happened that the entire class was out at once. From the third to the fourteenth day of the project—during the regular class hour—the students were:

A. in the field;
B. working in the classroom changing the field notes to color code, and putting both field map and colored map into condition for inspection by the teacher;
C. working on the master map (if they were on that committee); or
D. in conference with the teacher regarding their field work or map work.

Step II. Preparation of the Code and Selection of Areas of Work

The code was worked up during two days of class discussion and assignments. The preparation of the code by the students helped to fix in their minds the meaning of land-use and also helped them to memorize the code much more quickly. In general, the work proceeded as follows.

First Day

A. General discussion of land-use; meaning of the term
B. Listing on the blackboard suggestions from members of the class as to the various types of land-use in Plymouth
C. Condensing all of the suggested types into thirteen major types
D. Organization of four committees to subdivide the major land-use types. Heads of committees were appointed and the types of land-use apportioned as follows:
   1. Residential, social, recreational, commercial
   2. Manufacturing
   3. Transportation, communication, utilities
   4. Agriculture, mining, forest-woods, etc.

Each student chose the committee on which he wished to work. These assignments were due the following day. Time was allotted in class for the committees to work.

Second Day

E. Listing on the board the major types of land-use and the suggested subdivisions for each
F. Revision of the code upon suggestion either by the students or by the teacher
G. Choosing appropriate code letters—class participation
H. Choosing code colors—committee assigned to this and put to work immediately
I. Sending student to office to type off ditto stencil of the code. Copies run off and distributed to the class
J. Appointment of committee heads—students chose sections in which they wished to work (usually a section near home). Work apportioned within committees. Students signed up on the map of the city, designating work areas
K. Base maps distributed

CODE FOR PLYMOUTH LAND-USE SURVEY

R. **Recreation** (Blue)
c—commercial
n—non-commercial

RS. **Residential** (Green)
p—private (one-family)
d—duplexes
h—hotels

S. **Social** (Orange)
g—government property
e—educational—religious
i—institutions
c—cemeteries

C. **Commercial** (Red)
w—wholesale
r—retail

T. **Transportation** (Red with blue stripes)
r—railroads
b—busses
t—trucking—taxi

U. **Utilities** (Yellow with red dots)
e—electric—water
g—gas

CO. **Communication** (Green dots)
t—telephone
w—wireless
n—newspaper

W. **Warehouses—storage** (Black dots on white background)

M. **Mining** (Purple)

MF. **Manufacturing** (Yellow)
ch—cheese (including both manufacturing and processing)
a—bowling alley equipment
i—implements
g—grain
ca—canning
b—boxes (containers for cheese products)
t—tombstones
p—pastries—baked goods
d—dairies
pp—paper
bd—bandages (casings for cheese products)
sp—soda pop
c—cigars

A. **Agriculture** (Brown)
p—pasture
g—gardens
h—horticulture
c—cropland (other than gardens)

F. **Forest-Woods** (Green with brown stripes)

V. **Vacant—idle land** (White)

STEP III. FIELD WORK

All of the field work was done by the students themselves, either individually or in groups. The field work was carried out as follows.

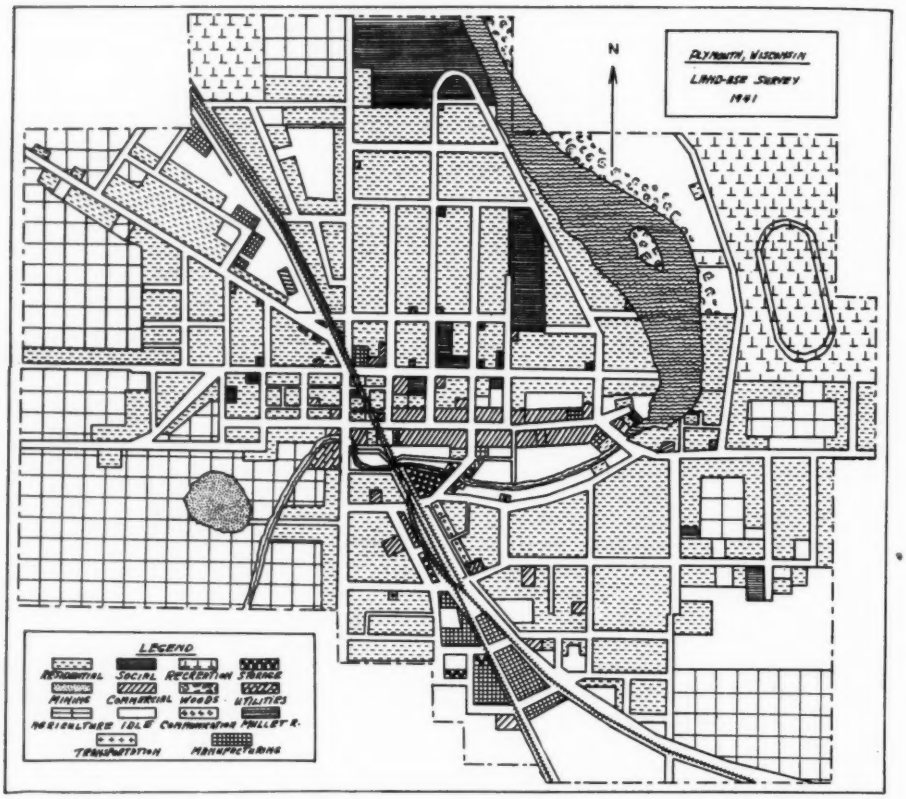

Fig. 1. Land use in Plymouth, Wisconsin (reproduced from colored map prepared by students).

A. Preparation for going into the field

At this point each student knew where he was to work and had so indicated to the teacher. Students were advised to use the following equipment in the field:

1. a 9 x 12 heavy cardboard sheet for writing on
2. two or three sharp pencils—no pen
3. a good eraser
4. a clamp or something similar for fastening base map to writing board
5. a sheet of scratch paper attached to the board
6. a copy of the code

B. Demonstration-practice lesson

The teacher gave the students a demonstration and practice lesson in the area near the school. This area happened to be mostly residential and was fairly easy to identify and place in code on the map. During the lesson students were shown how to:

1. orient the map with the compass
2. observe the use of land

3. indicate on the map by the code the use observed
4. mark off on the map approximate boundaries between various uses of land (noting the general relationship of nearby objects helped to establish boundary lines), and
5. check with other members the accuracy of observation and recording

As a result of this lesson, the area immediately adjoining the school was completed. The class then returned to the classroom and discussed problems and questions raised during the demonstration lesson. Students were now ready to begin field work.

C. Individual field work

Students did their field work during the regular class period each day, during study periods, during homeroom periods, after school, and on Saturdays. Transportation was effected by walking, driving, or bicycling.

Code sheets were attached to the work board. As observations were made, the appropriate code was written on the base map. Approximate boundary lines were sketched in between the various types of land-use. Figure 2 is a composite of all the field notes taken for the southeastern section of Plymouth.

Students took more detailed field notes than were finally used in compiling the master map (Figure 1). For example, in mapping the areas used for *Manufacturing,* students also indicated by code the type of manufacturing (MFch—(*Manufacturing*) cheese). The decision to take more detailed field notes was

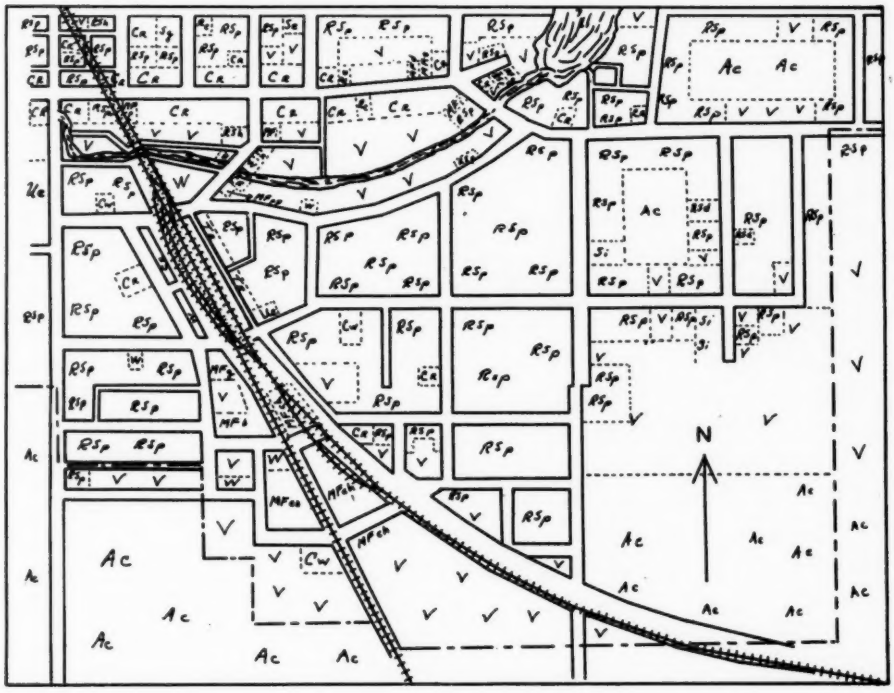

Fig. 2. Land use in southeastern section of Plymouth (reproduced from students' field maps). For explanation of symbols, see Code, page 181.

made in compiling the code. Student interest was the guiding factor in making the decision. These notes can be used at a later date in other work involving the geography of the home community. Because of the small scale of the base map and because of the lack of time, it was found best to confine our recordings on the master map to the major types of land-use.

STEP IV. TRANSLATING FIELD NOTES INTO COLOR ON INDIVIDUAL MAPS

Students worked independently on this part of the project, translating field notes into color code as they were ready. As each student completed his field work, he returned to the classroom, secured a clean copy of his section of the base map, and proceeded to record his field observations in color. He then turned in to the teacher both his field map and his colored map. Students were cautioned about (1) naming the completed color map; (2) adding a neat legend to the map; and (3) the use of art principles in making the map as a whole.

STEP V. MAKING THE MASTER MAP

The master map was also executed in color code. A student committee of four was selected by the teacher to work on the master map. This was found necessary in order that the coloring on the map might be more uniform and in order that there might be a minimum of error.

In compiling the master map, the committee had access to all of the students' notes. Wherever discrepancies were found, those students whose work was involved were called upon to rectify the matter either by making corrections in the classroom, if possible, or by returning to the field for further observation and recording. Students were most conscientious about making corrections, doing much extra work to be sure that their maps were correct.

The completed master map was in pencil crayon. It was attractively mounted on heavy white poster board and put on display in the classroom. To heighten the display, samples of students' field notes and color maps, as well as a copy of the code, were fastened on the bulletin board surrounding the master map. This was done in such a way as to show the entire process of the map-making project.

Student enthusiasm was high thruout the entire project. At no time was it necessary to prod a student about getting his work done. Students who were normally classroom problems, discipline or otherwise, worked eagerly on the project.

WORK TO BE DONE ANOTHER YEAR

The final step in the project would be that of oral and written interpretations of the master map. Since the project was begun too late in the year for Plymouth High School students to complete this final step, work ended with the making of the master map. Next year, several steps might be taken to utilize the experience of this project:

A. The new class might make its own map showing land-use in Plymouth, as a check on the accuracy of the previous class, particularly the accuracy of boundaries for areas covering less than a city block.
B. The new class might do the oral and written interpretations of the use of land in Plymouth.
C. The new class might take sections—such as the manufacturing areas near the railroad—and enlarge and further classify them.
D. The new class might try the same type of project in a rural area.

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THE PLACE OF GEOGRAPHY IN THE FIVE AREAS OF KNOWLEDGE OF THE NEW ILLINOIS CURRICULUM*

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This is a day of curriculum revision. Perhaps at no period in the history of education has so much attention been given to this important problem. In such revision, care should be taken not to lose old and tried values in grasping for new and more glamorous ones. A progressive, yet conservative attitude appears to be a reasonable position in these days of varying and uncertain curriculum content.

Illinois, in common with some of its sister states, is experimenting with a new elementary curriculum for the rural schools. This proposed revision grows out of an overcrowded daily program with more than a score of recitations, each lasting but a few minutes. Moreover, it is alleged that the present curriculum has become an end in itself, rather than a means for educating the child.

The following is an analytical study of the proposed Illinois curriculum in an attempt to discover how much attention is given to geography in the new arrangement. Some evaluations may be given in places, but for the most part facts only are presented.

ORIGIN AND DEVELOPMENT OF THE EXPERIMENT

The present program was started in 1937 when the State Curriculum Steering Committee prepared a bulletin for teacher study groups. This bulletin sets forth a philosophy for the improvement of instruction in the public schools of Illinois. The committee was appointed in the Office of State Superintendent of Public Instruction with the advice of the Associations of County and City Superintendents, and was under the immediate direction of the first assistant state superintendent, Charles C. Stadtman.

The proposed revision is for the rural schools only, altho most of it can be applied to other elementary schools equally well. The curriculum of most elementary schools is largely directed by the city principal or superintendent. The rural schools are more immediately under the direction of the State Superintendent's Office than are the other elementary schools of the state. The county superintendents requested the help of the State Department in a revision of the rural curriculum.

* Presented at the New York meeting of the National Council of Geography Teachers, December, 1941.

It was decided to set up a revised curriculum and leave its acceptance and use to county superintendents and to individual teachers. Its use is optional and its wholesale adoption has been discouraged until those using it understand the aims and purposes of the experiment, and until they have assimilated the new procedures involved. It is to be introduced slowly and frequent revision made in the light of actual classroom experience.

Whatever one may think of the proposed curriculum, most people will agree upon the soundness of the method of introduction employed. Since it is not compulsory, opposition has been largely disarmed because no one has to use it. This has had an interesting psychological effect. Many who would have opposed its compulsory use became interested and, one may almost say, sympathetic, sideline spectators. Some teachers agreed to try out the new curriculum, and some progressive county superintendents have encouraged certain strong teachers to participate in the experiment.

The following paragraph from a letter written by the first assistant superintendent sets forth the plans for revision and use.

"This whole program is one of guidance. We are not laying down any courses of study nor are we saying that any particular county or school district has to follow the program. It is rather in the form of a leadership consisting of materials developed by individuals who have to do with the supervision and preparation of teachers, which materials will later be revised in the light of the findings of the actual class room teacher who tries to apply them in her work."

This curriculum revision is in the preliminary stages. It will require some time to evaluate properly the success of the experiment. Twenty-five thousand copies of each of the curriculum bulletins have been sent out from the state office. Some of these have been received enthusiastically by teachers and county superintendents, but others have thrown them in the wastebasket because they departed too radically from the type of education teachers and county superintendents received when they were in the grade school. Some teachers accept them because it gives opportunity to do what they have long wanted to do.

AIMS AND GOALS

The primary objective of the revision is to make the child, not subjects, the center of the school. In order to accomplish this goal,

marked changes are proposed in the curriculum. Quoting from guiding principles in Bulletin No. II, published in 1940:

> An enriched educational program does not divide the day into short periods for recitation in each subject. It tends to group related subjects together so that they may provide experiences for children in continuous activities over broader areas.
>
> The enriched program uses subject matter as a means to the development of the children. Subjects of study are not of particularly intrinsic value in themselves. To be of value they must consist of that part of the civilization of the race, an understanding of which is necessary to a well-developed individual who takes his place in society. It is, therefore, necessary that children be led into experiences which will give them an understanding of such subjects.

These paragraphs set forth rather concisely the objectives of the proposed revision.

Organization into Fields and Units

In the Illinois plan the whole curriculum is divided into five areas of knowledge, namely, The Language Arts, including reading, spelling, literature and composition; Social Studies, including history, geography and civics; Natural Science including nature study, geography, and physiology; Mathematics, made up of the usual tool mathematical concepts; and Fine and Applied Arts including art, music, home economics, and manual training. Studies are to be made largely by units, and the content of all five fields is to be correlated and integrated as carefully as possible in the various units.

In order to make the proposed curriculum more concrete, bulletins have been prepared in the five areas already listed. The first bulletins were mimeographed and bound in manila covers. The contents are largely suggestive. Following an introduction, illustrative procedures for the primary, intermediate, and advanced levels are given. These procedures are based upon units, involving a large amount of pupil activity. Following the illustrative units, additional units for that level are suggested.

Geography in the Social Studies Area

The revised bulletin of the Social Studies Area is made up of a chapter setting forth the purpose of the revision and a philosophy of education relative to the Social Studies. This is followed by a chapter on the content of the Social Studies Curriculum in the first six years. The bulletin for the first six years is to be published at once, but the revision of the curriculum for the Social Studies of the 7th and 8th grades is to make up a supplementary bulletin which will be issued at some future time.

The bulletin for the first six grades has six illustrative units developed in much detail. The units for the first six grades are: first grade, "The Home"; second grade, "Trains"; third grade, "Life in Japan"; fourth grade, "The Early Greeks"; fifth grade, "Mexico"; sixth grade, "Scandinavian Countries." It will be noted that three out of the six illustrative units are geographically based; that is, they use a country or region as the basis for the study.

These units are developed in very great detail, each occupying from 30 to 60 double-spaced, typewritten pages in the unprinted manuscript. One of them might well occupy several weeks or even a month of time. They are carefully integrated and bring in other fields of knowledge including reading, poetry, literature, art, music, science, commerce, dramatics, and all the social studies. The following topics selected from a 19-page outline for the study of Scandinavia will illustrate the sort of thing that is studied: Customs; Amusements; Occupations; Natural Resources; Homes and Furnishings; Food; Education; Health and Medicine; Government; Gifts to Us.

Following the six illustrative units, twenty-eight other units are suggested from which the teacher may choose. The units are chosen by the authors because they are interesting, challenging, and adapted to the particular level. The following 17 suggested units on the Primary and Intermediate Levels appear to have geographic quality, or geography is involved in their study and development:

Farm
Production
Transportation as it applies to the community
Primitive people
Modern people
Racial types
Cultural types
Lowland types
Mountain types
Christmas in other lands
Mediterranean peoples
Desert types
Contrasts between what the explorers found and what the modern tourist sees in any one of the following:
  a. Mexico
  b. Florida
  c. California
Contrasts of colonial and modern life along the Atlantic seaboard
Contrasts of pioneer and modern life in:
  1. The Great Central Plains
  2. The South
  3. The West
Life in Medieval Europe
Life in areas of modern Europe whose social significance and international activities warrant consideration as centers from which pupils may build up geographic concepts.

The Suggested List of Social Study Units for the Advanced Level is taken from the first bulletin since the revision is not complete for the Upper Grades. The list includes:

Group I

I. A Latin Continent—South America
II. A Home of Blacks—Africa
III. A Continent of Whites—Australia

Group II

I. Life in pasture lands of the world
II. Fishing and fishermen
III. Life in the chief farming regions of the world.
IV. Geography of western expansion in the United States
V. Life in temperate and tropical forests
VI. Furs, fur farming, fur trading
VII. Primitive shelters and famous buildings
VIII. Manufacturing and city growth
IX. Communication and transportation
X. Mining and miners
XI. Desert and desert peoples
XII. Interdependence of nations

If the work is carried out as planned, geography, history, and civics will be included under the heading Social Studies, but each will not be studied as such. The usual divisions noted above will undoubtedly receive a considerable emphasis in teaching and in the use of text and reference books. Proponents of the plan believe that children will receive a better and more useful training from this integrated study than is attained by the present study of each individual subject.

Geography in the Natural Science Area

The two units suggested for treatment on the Primary Level are "Animals and Plants" and their adaptation to their environment. Much geography should logically be included in a study of the natural environmental habitats of plants and animals, and a good deal is suggested in the detailed outline. Again the amount taught will depend upon the teacher.

A long and detailed unit on "The Weather" is included on the Primary Level and the same unit is continued on the Intermediate Level. These units are well done and if followed and properly taught should give the child a good basic understanding of weather and climate.

A second unit started in the Primary Level is "Restoration and Conservation." Several of the topics for study such as "Trees and Minerals" have geographic value if proper application is made. This same unit is carried thru the Intermediate and Advanced Levels and presents abundant opportunities for emphasis upon the geographical basis of Conservation.

Other topics given on the Primary Level are:

Geographic Waterbodies
Geographic Landforms
The Universe
I. Our World
A. Develop concept of widening horizon. Lead up to an idea of space beyond child's experience.
B. The Sun
C. The Moon
D. Our Earth
E. Planets
F. Stars
Direction, Distance, Weight

The last topic involves numerous geographical concepts if properly presented. The unit on the "Universe" is carried thru the Intermediate and Advanced Levels with appropriate topics and studies for those levels. Proper teaching of the suggested outlines should certainly give the pupil adequate and thoro understanding of this important topic.

On the Advanced Level an outline is given for the unit on "Restoration and Conservation in Illinois." This is a rather thoro outline of this topic as related to the home state, but it does not give a complete picture of the topography, climatic conditions, regional delineation, industries, and transportation. However, a satisfactory outline for the geography of Illinois is given near the end of the outline on the Natural Science Area.

Achievement Goals

The Committee has set up certain "achievement goals" for various levels of each of the five content areas. Such goals are intended to suggest some of the achievements possible on the several levels. An examination of these goals gives some idea of the attention given to geography.

Social Science. Out of 32 achievement goals for the Primary Level listed by the committee, 13 appear to have definite geographic quality. Of 18 achievement goals for the Intermediate Level, 7 have geographic characteristics, and out of 20 goals listed for the Advanced Level, 15 appear to have geographic quality.

Natural Science. Seven achievement goals of a general nature are suggested for the Natural Science Area. Of the 10 more specific goals suggested for the Primary Level, 5 are geographic or have geographic quality. Four out of the 10 goals suggested for the Intermediate Level may be so classified and 5 out of the 12 on the Advanced Level are definitely of a geographic nature.

Some Conclusions

From this brief analytical study of the new Illinois Curriculum the following conclusions seem justified:

1. A fair, proportionate share of the suggested Unit Studies are of a geographical nature.

2. Many suggested Units, both geographical and otherwise, are optional and may or may not be taught.

3. What is taught of geography, or other fields of knowledge, depends upon the teacher and his training and inclinations.

4. If a reasonable amount of the geographical material suggested is taught, a fair acquaintance of the child with his community, state, nation, and world should be achieved.

The writer has not had any part in promoting the program; in fact, he has not been sympathetic toward much of it. His aim in this study has been to present a fair analysis of the plan and the place given to geography in it, regardless of personal beliefs and opinions.

Geographers are small in numbers. They may or may not like the new reorganization of curriculum studies. Do they oppose it on sound logical and pedagogical grounds, or are they just opposed to change, because it is uncomfortable and makes people work and think when they prefer leisure? It probably makes little difference. This movement appears to be on its way and has gained sufficient momentum that it cannot be stopped. We shall get farther in the end by collaborating with the movement and by using our influence to secure sufficient time, proper selection, reasonable allocation, and logical order and arrangement for geographical materials, and by insisting on properly trained teachers than by futile opposition.

The necessity for thoroly trained geography teachers cannot be over-emphasized. In the new curriculum, more than in the old, the choice of what is to be taught is determined by the teacher. The teacher may give much emphasis to geography or may almost omit it altogether. Therefore, train geography teachers. Elementary teachers, like the rest of us, teach what they know rather than get lost in the intricacies of an untried curriculum guide.

These curriculum revisions should be of the utmost interest to geography teachers. They are likely to influence the place of geography, as well as other fields of knowledge, in the curriculum for years to come. The place of geography in the elementary curriculum reacts upon the place and importance of geography on the high school and college levels. Therefore, the professional college geographer should be vitally interested.

GEOGRAPHY IN THE NEW YORK STATE SOCIAL STUDIES PROGRAM*

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State Teachers College, Buffalo, New York

The program of curriculum development in the social studies which has been underway in New York State for several years has now reached a stage where it may be analyzed to see what place geography has retained or gained in the program. Two committees have been at work on this program, one for the elementary and one for the secondary level, the division having been made on the six-six plan.

Many schools in the state still follow separate courses in geography, history, and civics for the first eight grades. These courses are old, the geography outlines, for example, having been published in 1927 and 1928. That these syllabuses need revision is not questioned. The geography syllabus, acceptable in the general areas outlined for study, is encyclopedic in its factual content, a characteristic which has helped to limit the procedures and methods used in the classroom. Each syllabus was written without regard for the others. As a result, a sixth grader, for example, studies the geography of Europe, Asia, Africa and South America, the history of the North American colonies, and the civics of his national government.

The first change in the situation came in 1932, before the present program was begun, when a Handbook for Rural Schools, Curriculum Bulletin No. 2, was published by the State Department of Education. The bulletin included the essence of the syllabuses in history, geography, and civics, but rearranged the material to permit correlation or fusion.

When the present program of revision was begun, the state committee and state department of education invited the elementary schools of the state to coöperate by initiating local programs of revision under four plans suggested by the committee. Three hundred eighty-five schools and school systems had volunteered at the last report, and more schools are starting local curriculum revision one by one.

By far the largest group among these schools is working under

* Abstract of a paper read at a meeting of the National Council of Geography Teachers, New York City, December 31, 1942.

Plan I, in which the procedures are based upon the bulletin mentioned above. Smaller groups are working under Plan III and Plan IV, which permit schools to submit plans they have initiated.

Plan II allows schools to work out local courses of study under the guidance of a Frame of Reference, which is a chart of possible outcomes. This chart allows great departure from traditional lines. Along the left side of the chart are listed seven major social concepts influencing the selection of content. One of these concepts is essentially geographic: "Man is conditioned by the earth's surface and is influenced by his environment." Others may be developed by materials drawn largely from the field of geography: "For effective living man needs food, clothing, shelter," "Interdependence among peoples is furthered by communication and transportation." These might, however, be developed without emphasis on geographic concepts.

The chief criticism made by geographers of this Frame of Reference is that under the wide choice of subject matter and its organization allowed by the chart, one might accomplish its objectives without ever once teaching a region or a country as a whole. A child might never see the way in which the human and physical factors combine into that complex we call the regional character; nor would he be able to visualize and to understand the regional pattern of this world in which he lives.

Reports made by the state committee, and observation of practice in several schools, bring us to the conclusion that the local committees and administrators tend to be conservative and that they do not depart far from the arrangement of subject matter areas in the Handbook for the Rural Schools. The history and geography are worked in together, but geography receives by far the greater emphasis of any of the subject matter fields involved. An effort is made to select wisely the units to be taught from the large area so that teaching may be better and learning more attractive than under the old, too comprehensive outline.

Curriculum revision in social studies in the secondary schools has been carried to a more definitive stage than that in the elementary schools. An outline of content for the years from the seventh to the twelfth inclusive was published in 1940. (*A Framework of Content for the Secondary School Program in Social Studies.* Bureau of Curriculum Development, Albany, New York.) Many schools have introduced this program.

Up until 1940, the only required course in geography was that of the seventh grade, a study of world geography from the economic point-of-view which served to put the capstone on the elementary school geography and which was regarded as a part of that sequence. Economic Geography was given in the ninth or tenth years for students in the commercial course.

The proposed program for the junior and senior high schools is a fused course. Large themes are set in a sequential arrangement and are developed by materials drawn from the many fields of the social studies. Certain of the topics draw more heavily upon the content of geography than do others. The work of the seventh year, "Our Community" may be considered about half geographic content. The same is true of the ninth grade work, "Our Economic World." The themes of other years are: "Our American Heritage," "The Development of World Institutions," "American Institutions and Traditions," "Problems of American Life." It is the intention of the curriculum committee that considerable geographic material be included in the development of these topics. The bulletin which outlines the content of the six year plan includes such statements as these: "The future citizenship should be familiar with the world picture, the distribution of natural resources, the peoples of the world and their ways of living." "A general knowledge of world geography is basic to an understanding of the economic world of to-day."

It would seem that geography is to have a greater place than before in the social studies program of the secondary school. We cannot, however, settle back complacently. The outline in the bulletin quoted above does not fill in details. Those are left to the local committees. We must wonder to what extent each local committee working out its instructional units will carry thru the interest in geography. We must remember the lack of geography in the training of most of the high school teachers of history or social studies. This lack of geographic training will, without question, be reflected not only in the units prepared by local committees, but also in classroom instruction.

It is clear that if we wish to see geography retain its importance in the elementary school and gain ground in the secondary school, we must work toward better preparation of teachers in geography.

We need to give help where we can to teachers and to local

committees who are carrying so much responsibility in the preparation of curricular materials. We need to offer bibliographies of available materials, and we need to make more materials available. The present interest in Latin America gives us an illustration. High schools are adding units on South America to their social studies courses. Histories of Latin America are coming from the presses at a great rate. Is anyone writing a geography of Latin America at the secondary school level?

If history and geography are to be fused, teachers must be helped to see that phases of geography besides that of sailor geography are related to the other fields of the social studies. Bibliographies, outlines, testing materials, especially directed articles, all could help high school teachers who are making a genuine effort to include geography in their social studies work.

As we look over the program for social studies in both elementary and secondary schools, we can find reasons for encouragement and discouragement. We may not like to find the name geography gone from the title of the course of study, or the subject absorbed into a fused course, but we may be gratified to find that teachers who are free to experiment keep close to a core of geography and those who are working in the secondary schools intending to give the subject greater emphasis. The situation in both the elementary and secondary schools is challenging to geography and geographers.

A LETTER TO STATE COUNCILS OF GEOGRAPHY TEACHERS

To State Council Directors:

The National Council requests your participation in an experimental project aiming to bring about closer cooperation between state and national groups of geography teachers. One session of the 1942 meeting of the National Council of Geography Teachers will be opened to papers submitted by state councils. Since the National Council hopes by this means to become acquainted with talented younger members of the state and local groups, the contest is open only to people who have not heretofore presented papers at National Council meetings.

Following is a statement of procedure:

1. Select the exceptionally good papers that have been presented since July 1, 1941 or will be presented by June 30, 1942 (a) at your annual meeting, (b) at academy of science meetings in your state, (c) at local teachers' meetings, (d) at your state teachers' meeting, or (e) on chapter programs of Gamma Theta Upsilon.
2. Let a committee of your state council select the best three of these papers.
3. Submit this group of *best papers* to the committee of the National Council before August 15, 1942, in order that the writers of the best four or five papers may be invited to participate in the 1942 meeting of the National Council.
   The personnel of the Committee follows:
   Dr. C. Langdon White, Chairman
   Western Reserve University
   Cleveland, Ohio
   Dr. John H. Garland
   Western Reserve University
   Cleveland, Ohio
   Miss Adelaide Blouch
   Public Schools
   Lakewood, Ohio
4. For further information write directly to Dr. White.

Very cordially yours,
FLOYD F. CUNNINGHAM, *President*
National Council of Geography Teachers

EDITORIAL NOTES AND NEWS

Following is an additional list of geographers who have entered war service. For other lists see the JOURNAL for December, 1941 and March, 1942.

Military Intelligence Division

Lieut. Harry R. Snyder (Teachers College, Columbia)
Richard L. Tuthill (Teachers College, Columbia)
Ovid Miller McMillion (Wilson Teachers College, Washington, D.C.)

Committee on Aviation Education Research, Civil Aeronautics

Hubert A. Bauer (University of Washington)
George T. Renner (Teachers College, Columbia)

Consultant

George T. Renner: Department of Commerce; National Resources Planning Board.

Geography teachers in colleges, and, to some extent, secondary schools have always taught map, chart, and photograph interpretation. They are now confronted by a new problem, viz., how to make such teaching more effective in preparing students for military service. Teachers are asking: Just what should we teach that will be of maximum value? After all the important thing is to be able to read correctly a map, chart, or photograph. Exactly what is shown? What is the significance of what is shown? These are basic questions that you have always been endeavoring to answer in your teaching. So far as we have been able to learn our military organizations have not published manuals for general use. However, there are two sources now available that the JOURNAL commends. As we learn of others we will call them to your attention. First, we suggest that you secure a copy of a recent *Bibliography of Military Geology and Geography*, prepared by the Geological Society of America, 419 W. 117th St., New York City. This list contains numerous references that will be highly valuable to you. Second, we suggest a little inexpensive (only a dollar) book by Lt. Col. W. F. Heavey, *Map and Aerial Photo Reading*, published by Military Service Publishing Co., Harrisburg, Pennsylvania. This book was written specifically for officer training. It is comparatively simple in language, clear in explanation, fully illustrated, definite, and practical.

MISS ANNE GOEBEL, State Teachers College, Emporia, Kansas, will be in charge of the Geography Section of the N.E.A. which will meet in Denver this summer. There will be a joint meeting of the National Council of Geography Teachers and the National Council for the Social Studies on Wednesday afternoon, July 1. Miss Myrtle Roberts, of Woodrow Wilson High School of Dallas, Texas, will have charge of the program arrangements for the meetings of the National Council for the Social Studies.

The following excerpt from an address delivered by Dr. John W. Studebaker, United States Commissioner of Education, at the National Conference of College and University Presidents held in Baltimore March 3-4, 1942, is highly significant.

"First, now is the time to begin really to teach the American people geography. Apart from rather backward nations, we are more illiterate geographically than any civilized nation I know. The reason is that we have never really taught geography. Now there are a few exceptions in some places, but I mean that by and large we haven't taught geography to our citizens. Young people have stopped studying geography in about the seventh or eighth grade of the common school, if they got that far, and for

the most part they were taught geography up to that time in their school courses. If we can get out of that policy an intelligent understanding of the world on the part of those taught, I would like to know how to do it. So I would recommend that in some way throughout the secondary schools and in the colleges and universities a real emphasis now be laid upon acquainting the American citizens with the realities of the world through intensive courses in world geography. It is in these later years of the educational scheme that the students have achieved the maturity necessary to an understanding of this important subject."

Does your high school curriculum provide for such training in geography? Do your students have an opportunity to become acquainted with the geography of the world in which they live and with which they must deal? Do you have teachers as well trained in modern geography as in other subjects?—Editor

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DR. S. S. VISHER, University of Indiana, has supplied the following timely and valuable note.—Editor

Seven dot maps on a county basis which are scheduled to appear in the third volume on agriculture of the 1940 census reports have just been received from an official in the Bureau. What they reveal as to increases and decreases will interest many readers of the JOURNAL OF GEOGRAPHY and hence the maps are briefly described.

Horses. Between April 1, 1930, and April 1, 1940, there was a decrease of 3,296,603 horses in the United States, or 24.6 percent. The decrease was largest in the Corn Belt and Great Plains. There was a considerable increase in the number of horses in Arkansas and Louisiana and a small increase in Kentucky, Tennessee, Mississippi and Texas.

Mules. In that decade the number of mules decreased 1,509,390 or 28.2 percent, a somewhat larger percentage decrease than for horses. The decrease was greatest in Texas but was large in Oklahoma and most other southern states, and was considerable in the region from Indiana to Kansas. Increases in the number of mules occurred in the tobacco growing section of North Carolina and adjacent part of Virginia and South Carolina, and also in part of Mississippi.

Cattle. Between 1930 and 1940 there was an increase of 6,424,436 head in the number of cattle over 3 months old on April 1. This is an increase of 11.8 per cent. Gains occurred in all parts of the country except the Great Plains. They were exceptionally large in Iowa but were considerable in a narrow belt close to the Gulf of Mexico.

Cows milked. A total of 812,335 more cows were milked in 1939 than in 1929, an increase of 3.8 per cent. Thus the percentage increase in cows milked was only one third as great as the increase in all cattle. The greatest increase in milk cows was in a belt extending from Minnesota to northern Ohio, especially in Wisconsin, Lower Michigan and northeastern Indiana. There was a considerable decrease in the Great Plains States and locally in the Mountain States and New England. A dozen small areas in the South showed heavy increases, especially central Tennessee, northern Mississippi and eastern Texas.

Hogs. There was a net increase of 1,243,625 hogs between 1930 and 1940, the 3.8 per cent increase being widely distributed over the country with the exception of one area in which there was a very heavy decrease. That area extends from northern Kansas to South Dakota. In eastern Nebraska and the adjacent parts of Iowa and South Dakota the decrease was especially heavy.

Chickens. In the decade 1930-1940 the number of chickens three months old or older decreased 40,929,136 or 10.8 per cent. The decrease was general and was moderately

heavy in the Corn Belt States and most of the Pacific Coast poultry raising areas, and also in Maryland. The chief increases were in New England and New Jersey, and in the South. The increases in the South were general.

Turkeys. The number of turkeys raised in 1939 increased 66.3 percent over 1929. The 11,139,271 were mostly in the North or in California and Oregon. There was a decline in the South, especially in Texas, altho southeastern Texas had a gain. There also was a decline near the Canadian border, except in central Minnesota and central North Dakota. California showed a large increase, but only partly in the areas where there had been a decline in the number of chickens. The Willamette valley of Oregon and the southern tier of counties of Minnesota showed the sharpest increases.

The modern automobile, apart from metals, uses a surprising number of products obtained from the farm and forest. Plant products in most active demand come from the cotton plant, the soy bean, flax, castor bean, corn, wheat, sugar cane, and jute. Trees furnish the wood, also the rubber, tung oil, and the resinous products. Included among the products from the animal kingdom are wool, hides, bristles, beeswax, and lard.

American farmers sold about $10,000,000 worth of Christmas greens in 1941, according to estimates of the U. S. Department of Agriculture. In some areas, the plants from which the greens are taken are also useful in checking soil erosion.

Canada supplies the American market each year with 4,000,000 to 5,000,000 Christmas trees. From 100,000 to 300,000 are also imported by the United States from Newfoundland.

The following ten cities listed in the order of their ranking do one-quarter of the total retail trade of the United States: New York City, Chicago, Los Angeles, Philadelphia, Detroit, Boston, Cleveland, Washington, D.C., San Francisco, and Baltimore. Their total retail trade was $33,000,000,000, according to the 1939 Census.

Alaska's production is valued at 200 times its purchase price of 75 years ago. Salmon and gold are the top producers but liberal contributions have come from the production of furs, copper, wood products, and the platinum metals. Salmon exports usually total between 35 and 50 million dollars, with gold at half that figure. The 1940 Census reported a population of 72,524, but our Defense Program will probably swell that figure more than any past boom has done.

The first bar of solid metal ever made from the minerals in sea water was produced, January 21, 1941. It was made of magnesium at Freeport, Texas. Millions of gallons of sea water are used daily in this magnesium plant. The sea water is mixed with lime made from nearby oyster shells, to form magnesium hydrate. The latter when treated with hydrochloric acid forms magnesium chloride. When magnesium chloride is dried and melted in a furnace, the chlorine is removed, and molten magnesium is thus obtained. One cubic foot of this metal weighs 112 pounds in contrast with the same volume of aluminum which weighs 175 pounds. At present its greatest use is in alloys for airplanes as it is the worlds lightest metal. Chipped or powdered it goes into flash bombs, incendiary bombs, and signal flares.